Space Weather Forecast

Issued on Sunday, 01 October 2023 at 13:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-flares throughout. Chance of G1 Minor Storm conditions on day 2 (02 Oct).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with frequent Common class and two Moderate class flares. There are eight sunspot regions on the disc. Two new regions have emerged in the east as two others recently rotated out of view around the western limb. The most notable regions are the two sunspots in the far northeast; the southernmost of which is the source of the Moderate class flares and the most magnetically complex currently. The two regions are close enough to have some potential interaction between them. The largest region is in the southeast, though this spot seems to be simplifying. Elsewhere on the disc, the remaining spots are all stable and largely inactive at this time, including the two new regions which have appeared recently in the eastern hemisphere.

No Earth-directed CMEs (coronal mass ejections) have been observed.

Solar Wind / Geomagnetic Activity: Solar winds remain at slightly elevated levels. The interplanetary magnetic field was weak. The north-south component has been mostly weakly negative. Resultant geomagnetic activity was Quiet to Unsettled (Kp 1-3), with one Active period (Kp 4) between 0000-0300 on 01 Oct.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels, with no Solar Radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate with a chance of further isolated Moderate-class flares.

Solar Wind / Geomagnetic Activity: There are no Earth-directed coronal mass ejections. The next notable enhancement is most likely to occur on day 2 (02 Oct) due to the arrival of a coronal hole fast wind. A further, small coronal hole enhancement is possible late day 3 (03 Oct) or more likely on day 4 (04 Oct). Geomagnetic activity is expected to be Quiet to Unsettled on day 1 (01 Oct), then Quiet to Active between days 2-4 (02-04 Oct) with a chance of G1 Minor Storms.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at Background levels, with no Solar Radiation storms expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	30	20	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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